

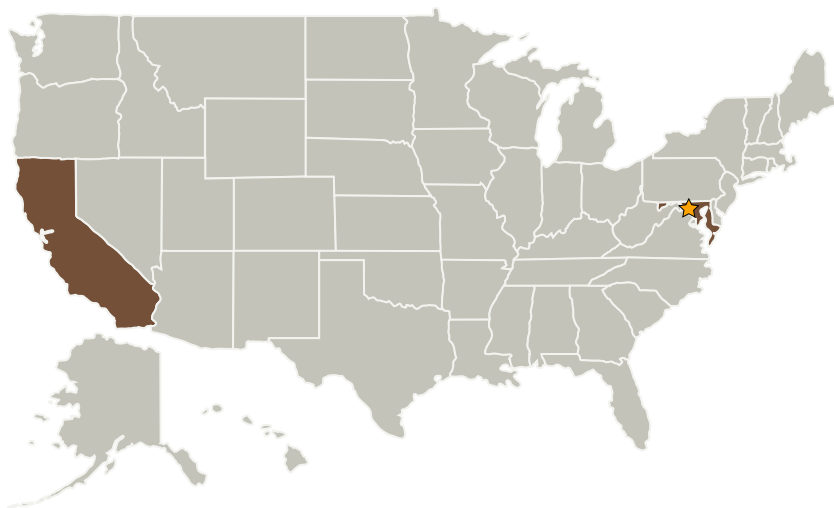
Near Shannon Limit Low Peak Mean To Envelope Power Ratio (PMEPR) Turbo Block Coded OFDM for Space Communications, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

It is proposed to study and develop an innovative Turbo-block coded modulation scheme suitable for Orthogonal Frequency Division Modulation (OFDM) system. The new approach not only is capable of reaching the Shannon limit capacity, but it can also reduce the peak to envelope power ratio (PMEPR) of the OFDM symbols. This approach is unique since the design of high performance capacity achieving codes where all the OFDM signals produced by the codewords with low peak to average power ratio remains an extremely important, albeit a very difficult problem to solve, because a physical layer based on such codes can significantly reduce the cost of base stations. Typically, about 45% of the total cost of OFDM base stations corresponds to that of power amplifiers. This is due to the large linear region requirement of power amplifiers in these systems. OFDM transmission requires a large power amplifier linear region because of its relatively high peak to average power ratio signals. Thus OFDM power amplifiers are particularly expensive. Furthermore, reduction of PMEPR will reduce cost and power consumption for mobile units, enabling wider deployments and longer battery life.

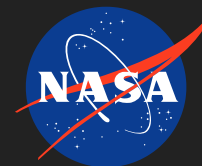
Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Doradus Technologies, Inc.	Supporting Organization	Industry	San Jose, California

Primary U.S. Work Locations	
California	Maryland

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.2 Power-Efficiency